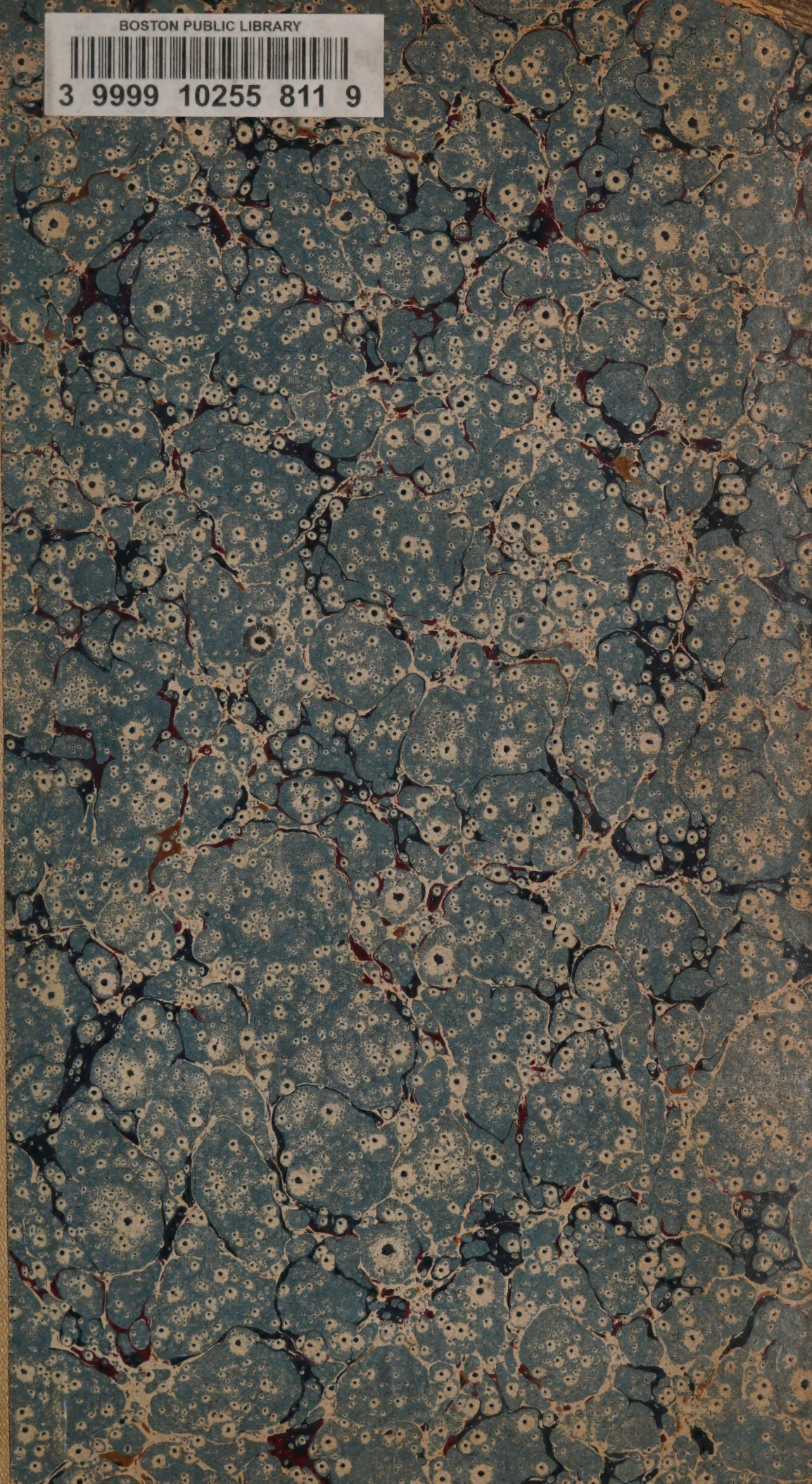


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AN INQUIRY

3847.9
INTO THE

USES AND ABUSES OF THE PRACTICE

OF

SCRAPING AND WASHING TREES.

BY A COMMITTEE

OF THE

MASSACHUSETTS HORTICULTURAL SOCIETY.



BOSTON:

DUTTON AND WENTWORTH, PRINTERS.

No. 37 Congress Street,

1854.

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1854.

Extract from the Records of the Massachusetts Horticultural Society, April 3d, 1854.

On motion of R. Morris Copeland, it was voted, that Messrs. COPELAND, BOWDITCH and KING be a Committee to inquire into the present practice of Scraping and Washing Fruit and other Ornamental Trees, and report whether, as a general practice, it was beneficial or injurious to vegetation, and the reasons for its continuance or cessation.

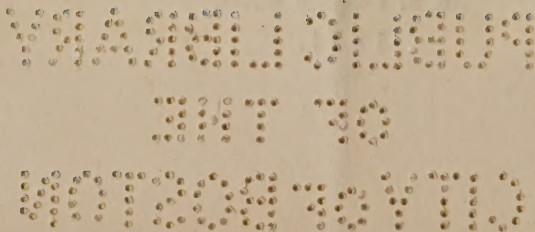
Extract from the Records, April 17.

The Committee to whom was referred, as above, made their report, through Mr. Copeland, chairman.

On motion of Mr. Samuel Walker, it was voted that the report be printed, and laid upon the table.

W. C. STRONG, *Rec. Sec.*

Est. of
Henry W. Haynes
July 1, 1912



REPORT.

By a vote of the Massachusetts Horticultural Society, on Saturday, the 3d of April, 1854, a Committee was appointed to inquire into the present practice of Scraping Fruit and Ornamental Trees, and report whether, as a general practice, it was beneficial or injurious to vegetation, and the reasons for its continuance or cessation.

The immediate cause of this inquiry was the regret felt by many at seeing our noble Boston elms stripped of their rough outside covering, with all its wealth of lichens and mosses.

Naturally enough those of us who study nature as she is at home, and who see daily how wondrous and careful is the provision she makes for the various divisions of her productions, vegetable and animal, cannot believe that she could have so constituted the bark of trees as to make it the matrix for varied disease.

It does not seem *natural* that when, from the minutest infusoria to the revolving stars, everything is adjusted with such exact nicety that in no case one portion of creation shall trench on the rights of another, in this respect of trees' barks no care should have been taken to keep the tree in a state of health, and enable it to deliver itself from all outside intruders. We have thought that if vegetable physiology be true, if the outside bark is really dead, and connected with the live tree underneath in the same manner that the coat is with the man, any lichens, mosses, or other parasitic plants were probably connected with that bark similarly to the buttons and decorations of the coat. No man absolutely needs a coat and shirt, yet were he divested of them in this cold and hot climate, his sufferings would be intense; and, therefore, we have deductively reasoned, that the cloth coat of man, the hair of animals, and the bark of trees are necessary to the respective individuals in the direct ratio of their sensitive natures and vitalities; and just as much as the differently organized animal knows not whether man should wear winter or summer coat, man is unable to decide as to the advisability of reducing a tree to the raw and exposed state.

Investigation has proved to this committee that whilst arguments have been advanced in favor of scraping, because, 1st, it destroys lichens and other parasites; 2d, removes dead bark, and the eggs of insects to be, in the summer, injurious to the tree harboring them; and 3d, because,

in the opinion of the operator, not alone the health of the tree is improved, but its beauty greatly increased, in reality none of these arguments will or ought to hold good.

But that, 1st, the lichens and other parasites commonly found on well cultivated trees, grow from the dead bark alone, and have no connection with the life and health of the tree; and that these lichens and parasites, which really indicate the tree itself to be diseased, exist *in consequence* and are not the *causes* of the tree's decline. 2d, That no insects, with exceptions hereafter to be mentioned, injurious to the tree's well being, harbor in the outside bark, or may be removed by the before mentioned process. 3d, That the real beauty of the tree is injured beyond all comparison by any removal, or covering of the natural bark; and lastly, that nature intended these roughnesses, &c., of the bark, is *proved* by their being so universally the same on the same species that they are used by botanists as the specific characteristics of the variety of tree.

In order to clearly understand the reasons for the assertion that the common lichens, &c., are not connected with the life of the tree, it is desirable to understand the structure of the stem itself. We find that the seedling plant is composed of an inside pith, surrounded by a layer of wood, which in its turn is enveloped by a layer of bark. The sap from the roots rises through this wood into the upper surface of the leaves, where it is exposed to the light, is matured and elaborated, and thence passes through the lower side of the leaf to the bark, and downward to the roots. In the spring, the newly started sap passes down between the bark and the last year's wood, where is soon deposited a peculiar substance called cambium, which thickens, and gradually becomes filled with woody fibre, ultimately forming into sap wood, or alburnum; on the inside of the bark is also deposited from the sap, matter which thickens, and assumes the consistency and nature of last year's bark, called technically, endoplæum, or inner liber. This liber and alburnum, for the rest of the year, fulfil all the functions of vegetation, and make way in turn for new alburnum, and endoplæum or liber. It is thus we can explain why, in some cases, when the bark has been stripped from trees no injury ensued. This formation of wood and bark is completed in about six weeks in May and June. If, at that time, the old outside bark be stripped off just when the cambium is hardening, it will the more rapidly assume the appearance and character of healthy bark and liber, because nature will make an extra effort. The process is analogous to the skinning over of a new wound or burn; but, as in the human flesh, the new skin is very tender, and very much exposed to injury. Probably trees treated in that manner would be very subject to that common disease known as frost blight, which is the freezing of the sap in the vessels of the bark, and their consequent rupture, when the warm spring sun has started the tree into too early activity; and *farther, this thin and tender bark* would offer almost free passage to the army of borers, wood

wasps, bark lice, &c. However great the gain in one crop from this course, and as all horticulturists are aware, the injury or removal of the bark would tend to ripen the fruit earlier, and of a better quality that year, this advantage would be more than counterbalanced by the new liabilities to danger just mentioned.

We have thus seen that the outside bark is pushed ever farther from the wood, and its functions exercised by the new bark underneath, until, in process of time, it becomes to all intents dead, and has but little connection with the tree, in many species; for example (the shellbark and cork oak;) and this very disconnection induces the hasty thinker to remove it.

No one has as yet acquired sufficient intimacy with vegetative processes to predicate the *exact* benefit to the tree of this cortex; but experiments have shown that it is an almost perfect non-conductor of heat and cold, and from its close texture is able to protect the young bark from the ravages of insects, frost and blight, or any atmospherical disease. If then the cortex is dead and disconnected with the living wood below, what reasons have we for supposing that any lichens or parasites existent upon it are able to injure the tree?

In answering this inquiry it will be well to give the real or supposed reasons of the advocates for the scraping practice. They say that lichens, &c., are parasites, and derive their life from the substances on which they are found; if, then, we find them upon a tree, they must be feeding upon its secretions; and, more than this, as it is known that many trees, young and old, die soon after becoming covered with parasites, their death *must be attributed to the parasites*.

But how much is this assumption worth? It is true that parasites do derive a portion of life from the substances on which they are found, but they are almost universally found upon dead or dying matter, such as the very bark in question; nor is there any reason for supposing that in its healthy, normal state, the living tissue of the tree is ever reached by the roots of the lichens and mosses. It is true the same species are found upon the living and dead trees, yet on these becoming diseased, or dying, very many new species make their appearance.

We have taken nature as our guide; how is it with the best *natural* trees? Wherever you select the best specimen, do you not find its bark covered with many parasites? When you look at its noble stem after a shower, how resplendent is it with the rarest colors! But an analysis of the bark of that tree will show that none of the roots of these parasites penetrate deeper than the old bark in which they are imbedded; but if this tree be starved, if its supplies of manure, light, and air are cut off, its system will become rapidly enfeebled; and proportional to the strides of disease will be the increased growth of the former varieties, and the simultaneous appearance of new parasites. *It is only necessary to promote the conditions favorable to this kind of vegetation in order to increase the crop, for they will cultivate themselves.* Reduce the tendencies to decay; manure the

ground, drain off the water, bring back the sun and air, and immediately the bark will loosen, and the growth of parasites diminish.

But let us suppose a case; supposing we are about to plant three elms and three apple trees; for the first apple we will dig a large hole in rich soil, and plant it carefully, giving each root sufficient room; number two should be planted in a poor, wet soil; and number three shall be set, as too many are, in a sort of post hole, in any common land.

Of the elms, number one shall be planted in a large hole, and have the roots well lain out, in some lawn, or other ornamental grounds. Number two shall be set out by the roadside, in pure gravel, but shall have a large hole prepared for it. Number three shall be in a post hole in the gravelly roadside. Now, what fate will any horticulturist predict for these trees? It will be, that the number one apple, and number one elm will grow splendidly; will want no pruning more than to prevent limbs crossing each other, and yet, though luxuriant with health, and full of fruit and seed, *they will be found planted with many lichens*; but their very general health will forbid the idea of the parasites injuring the tree, although no doubt many over-careful farmers would remove even them. Numbers two will grow well enough for a year or two, but soon exhausting the soil will become stunted; and just as soon as growth is checked new lichens, &c., will appear, and soon cover the tree; but what else was to be expected? Numbers three will never thrive, and year after year by cutting in, and coaxing, a semblance of life will be preserved; but mosses, &c., will usurp the entire trunk. Does any horticulturist pretend to tell me aught else could have been expected?

Be sure that when trees are badly planted, in ill-prepared soil, disease and death will ensue, *and that no economy is so short sighted as that which prompts the purchase of poor trees, and then, whether they be poor or good, plants them badly.*

A member of this society has mentioned the slow growth of forest trees taken from the woods and swamps. It is the opinion of this committee that, except in very exceptional cases, no policy is more miserable; the money paid for the trees is a mere nothing; these forest trees cost much time to dig up, something for transportation, and then they have neither good roots nor well shaped stem and top. Nursery trees, from their many removals, are well supplied with fibrous roots, and are calculated to accommodate themselves to all soils.

In support of these opinions, we quote some extracts from a letter to the chairman of the committee, from GEO. B. EMERSON, author of the *Forest Trees of Massachusetts*:—

“I do not know that there is any reason for thinking that any of the lichens are injurious to the plants, on the bark of which they sometimes live. Many are usually considered as indicating decay, and are commonly supposed to be supported by the substance of other plants already crumbling away. They certainly give infinite beauty to the trunks of

trees in old forests, substituting for a monotonous uniformity of color the boundless variety of tint and fret work and delicate tracery, which never tire, bringing beautiful life out of death. They may, in the impartial benevolence of nature, sometimes give protection to various stages of insect life, for which we utilitarians feel little sympathy. I should be obliged to put it on the ground of taste. Why mar the beauty which wraps itself around decay?

Lichens prevail more, I think, as we go farther north. Are they not laid upon the surface as a protection from the cold of winter, and the heat of the sun of summer?"

In addition to the above, we give the opinion of Mr. Edw. Tuckerman, who is, perhaps, the best lichenographer in the country, which is as follows: the first extract is from a book published by him in 1845, entitled "An Enumeration of the Lichens of North America," p. 41. "The long debated question whether lichens injure the bark of trees on which they live, is not to be answered, says Fries, by mere denial! The first three named writers, (Hager, Hoffman, and Van Luyken,) think that lichens do not injure trees, and the last, (Mr. Merat,) that they do; but altogether they have contributed very little to our knowledge in the matter."

"Hagan considers the whole thing an aspersion upon lichens, and defends them most laboriously." "Mr. Merat, on the other hand, is persuaded that lichens are mischievous plants, and after showing them up to the best of his ability, gravely gives us recipes for their extirpation." "Soils and other circumstances, affecting the health of trees, are so various and uncertain, that in the midst of what seems to indicate power of indefinite duration, we constantly find symptoms of disease and decay." "Unhealthy *young trees* do not long survive after their epidermis is well covered with lichens, and in this stage it seems to be quite futile to remove the latter; but in older trunks the connection of these plants, with any morbid condition of the tree, is often very obscure, as indeed we might expect it to be."

"It is possible that an unhealthy state of the trunk, whether from soil or other circumstances, affords certain favorable conditions for the life and growth of the lichens that occupy it and accelerate its death; or it may be that the lichens themselves induce disease and accomplish dissolution more quickly and visibly in a young tree, more slowly and obscurely in an old."

"However it be, we assert generally again a probable connection between the life and growth of lichenose vegetation on trees and the death of the latter, and infer thence the probability of a law determining in this way the action of lichens on vegetable matter."

In further relation to this subject, Mr. T. says, in a letter of April 5, 1854, that he "still believes when the bark of a young tree is covered with lichens, it is doomed, *and beyond the reach of scraping*; but in that of old trees they are of no consequence, except, indeed, so far as they add

manifestly to the beauty and interest of the tree, and I should heartily concur in your views respecting this." "There are other unnatural operations in the culture of trees and shrubs, beside scraping, and therefore I feel very unwilling to pass a hasty judgment about what I have had no opportunity to become acquainted with. But I confess that I was shocked when my own few fruit trees here were scraped, and should rejoice never to have the rough operation repeated upon them." "It must be said, however, that when *mosses* form large thick cushions, as they often do, they are sometimes perfect sponges full of water, and cannot but injure what is under them." Thus we see, so far as his research has been able to carry him, he has never found any absolute confirmation of the belief of some, that the *lichens and mosses*, as *commonly* *occurrent*, injure the trees; but would discourage the practice, *on this, if no other principle*, that it is not best to violate the manifest regulations and habits of nature, for the mere chance of gaining a doubtful good.

The Rev. John Lewis Russell writes as follows with regard to this question:—

"From what observation I have been able to make on the habits of lichens, I feel persuaded that very few, if any, can be deemed injurious to vegetation.

"*Parmelia stellaris*, very common, grows upon the fruit spurs of pears; and so completely surrounds the spur, as to exclude the atmosphere from the bark of the spur. All lichens, which grow upon living bark, deposit slowly beneath them, earthy substances, perhaps dust, and thus again close the pores of the bark.

"I think that there can be no doubt but that generous cultivation would cause all such lichenose bark to desquamate from the trunk and leave the smaller branches; and a wash of potash and water, or of whale-oil soap, would, by the presence of the alkali, not only remove the lichens and insects, but give a bright appearance to the tree.

"There are some other smaller species of lichens, such as *Parmelia chrysophthalmia*, &c., &c., which also grow upon the smaller spray of fruit trees, but from their style of growth can positively do no harm.

"The living tree or the dead wood, or the inorganic earth or stone, serves only as a place for lichens to affix themselves; the nutriment is borrowed from the atmosphere! Besides, fruit trees liable to lichens are generally those cultivated in close areas, like small gardens, and as such are more under the eye of the watchful cultivator to apply remedial methods; as syringing with whale oil soap the upper spray, if necessary; a process used in destroying 'insects injurious to vegetation.'

"The mode of scraping and white washing trees is very barbarous; the first, in giving so artificial and shaven an appearance; the last, in injuring the bark by the caustic lime, and the filling the pores with its particles.

"Ornamental trees, or our forest trees long set out for shade and beauty, should never be touched by the scraper or brush, else we lose their sylvan

grace. To trim too severely, and to remove the mosses and lichens, are both in exceedingly bad taste and should be discouraged.

"We do not want works of art in our shade trees; man cannot improve on nature in them. No sort of harm can possibly come from their mossy and lichenose character, and the rather perhaps some good, in shielding the inferior layers of living bark from the horizontal rays of a powerful summer day's sun."

"Fruit trees are often baked by this horizontal sunshine, and the bark desiccates and dies of dry gangrene. The same would occur to shade or ornamental trees planted out for decoration, were they not commonly let alone and become *wisely neglected*."

Having thus demonstrated that in so far as lichens and their parasites are concerned, no benefit will accrue to the tree by scraping its bark, but probably injury, we can next turn our attention to the insects injurious to vegetation. In this portion of our argument we take the book of Prof. Harris as conclusive authority; and as very many persist in believing that insects do harbor under the rough bark of trees during the fall and winter, ready to sally forth in the spring, the following table is prepared to show, first, what insects live upon and in the trees selected, where in those trees they lay their eggs, the kind of injury they do to the trees, and the most effective means for their destruction. The trees selected are the apple, ash, cherry, elm, linden, maple, oak, pear, peach, plum; the list has been confined to these, because fruit trees have been supposed to be most infested, and the ornamental trees next. Now this table will make it evident that although every tree is the food of many varieties of insect life, the larger number have no connection whatever with the bark, but either live in the wood of the tree or on the twigs or leaves, in either of which cases, scraping would be of no benefit. It will be seen, upon consulting this list, that the apple, pear, and maple, have two insects, called the woolly aphid and bark louse, which deposit their eggs upon the bark near the roots, and in the forks of the branches.

These insects do suck much of the tree's sap, and should be removed; *but it is worse than useless to scrape and wash before we see they are present*; examine the trees, and if they are to be seen, remove them; but rigid iron cannot be thoroughly effective in this business. We have learned it is bad to expose the tender liber to the sun and air, by removing the cortex whilst we wish to get off the eggs and insects. The best way to do this is to get a wire brush, like that used by gunsmiths, and with this rub the affected portions of the bark; the wires will readily adapt themselves to all inequalities, and will easily destroy the enemy and leave the bark; this rubbing may be followed by a thorough washing of soft soap. This method is perfectly effectual, and entirely uninjurious to the tree. Caterpillars, as you know, do not destroy the bark, but the twigs and leaves, and are to be removed with the brush and potash, or soft or whale oil soap. The cankerworm must be kept down the tree by tar, melted india rubber,

troughs, or glass bands, and the curculio can be partially escaped by the same method, and by gathering up all the injured fruit ; planting the trees in hen or hog yards, or over running water. Many of the borers, (apple, pear, ash,) lay their eggs in the forks of the tree and near the ground upon the bark ; these may be rubbed off with a wire brush, the tree washed, and then covered with tea lead or strong sheathing paper, over the affected parts.

Name of Tree.	Name of Insect.	Where found on the Tree.	Death and means of Prevention.
Apple,	Aphis lanigera, woolly aphis, or American blight,	Crotches of the branches, and trunk of the tree, near the ground,	Rubbing with wire brush, and washing with oil soap.
"	Coccus arboreum linearis, conchiformis, cryptogamus, (bark lice,)	" " "	" " "
"	Geometer, or cankerworm,	Leaves and twigs, -	Tar, India rub., &c.
"	Hispa rosea, (beetles,) -	" " -	" " "
"	Elater, " -	" " -	" " "
"	Archians, (caterpillars,) -	" " -	Killed in the nest.
"	Orgyia leucostigma, -	" " -	[destroy it.
"	Liparians, (caterpillars,) -	Glues leaf to the stem,	Tear off the leaf and
"	Lasiocampians, (lackey, or camp caterpillars,)	Leaves, &c. -	In the nest.
"	Gastropocha Americana, the American lappet moth,	" " -	" " "
"	Attacus cecropia, -	" " -	" " "
"	Notodonta coccinea, -	" " -	In the nest.
"	Tree borers, -	In the wood of the tree, -	By a sharp wire.
"	Carpocapsa pomonella, codling moth, very rare,	" " -	" " "
Ash,	Trochileum denudatum, ash tree borer,	In the wood, -	" " "
Cherry,	Selandria cerasi, (slug,) -	On the leaves in numbers,	Sifted lime, &c., to taint the air ; showering with oil and soap.
"	Smerinthus myops, Sphinx—uncommon,	" " -	" " "
"	Buprestis divaricata, (wood borer,)	Deep in the wood, -	By a sharp wire
"	Lasiocampians, (caterpillars)	Leaves and twigs, -	In the nest.
"	Limacodes pithecium, hag moth, (caterpillar,)	" " -	" " "
"	Notodonta coccinea, (caterpillar,)	" " -	" " "
Elm,	Vanessa antiopa, interrogationis,	" " -	" " "
"	Arctia fuliginosa, tiger moth, (interrogationis,)	" " -	" " "
"	Cimbex ulmi, (saw fly,) -	" " -	" " "
"	Ceratonia quadricornis, Sphinx,	" " -	Kill the insect by picking off.
"	Geometer, or cankerworm,	" " -	Tar, &c.
"	Tremex Columba, (wood wasp,)	Deep in the wood, -	Wire.
"	Chrysomela scalaris, -	Leaves, -	[bacco water.
"	Galeruca californiensis,	Rare, -	Showering with to-
"	Saperda vestita, (wood borer,)	Deep in the wood, -	Wire.
Linden,	do. do. do.	" " " -	" [bacco water.
"	Chrysomela scalaris, -	Leaves, -	Showering with to-
"	Vanessa interrogationis, -	" " -	Nest.
"	Apatela Americana, -	" " -	Showering with do.
"	Cankerworm, -	" " -	Tar, &c.

Name of Tree.	Name of Insect.	Where found on the Tree.	Death and means of Prevention.
Maple,	<i>Apatela aceris</i> , - - -	Leaves, - - -	Showering with to-
"	<i>Clytus Hayii</i> , (borer,) - -	Under the bark, - - -	Wire. [bacco, &c.
Oak,	<i>Cynips confluens</i> , (gall fly,) -	Leaves, (oak apples,) -	"
"	<i>Stenocorus cinctus</i> , (oak pruner,) -	Branches. - - -	Gather up the branches and burn.
"	<i>Buprestis femorata</i> , (borer,) -	In the wood, - - -	Wire.
"	<i>Curculio hilaris</i> , - - -	" " - - -	"
"	<i>Cicada septendecem</i> , seventeen years locust, -	Wood and leaves, - - -	"
"	<i>Membracis univittata</i> , - - -	Twigs. - - -	
"	<i>Clisiocampa silvatica</i> , (caterpillars,) -	Forks of branches, - - -	In the nest.
"	<i>Perophora melsheimerii</i> very rare. -		
"	<i>Saturnia maia</i> , (lunar moth,) -	Leaves and twigs, - - -	Very rare.
"	<i>Dryocampa senatoria</i> , - - -	" " " - - -	In the nest.
Pear,	<i>Egeria pyri</i> , (borer,) - - -	In the wood, - - -	Wire.
"	<i>Urocera gigas</i> , " - - -	" " - - -	"
"	<i>Coccus cryptogamus</i> , (bark lice,) -	Trunk, forks and branches, -	Brush and suds.
"	<i>Selandria cerasi</i> , (slug,) -	As in the cherry, - - -	Sifted lime, &c.
"	<i>Areoda lanigera</i> , (tree beetle) -	Leaves. - - -	
"	<i>Scolytus pyri</i> , (blight beetle) -	The egg is laid in the bud, and the grub eats into branch, -	Cut off branch and destroy it.
"	<i>Cicada</i> , (locust,) - - -	Eats the roots badly, - - -	Uncover the roots and remove grubs.
"	<i>Psyllæ</i> , (plant lice,) - - -	Leaves. - - -	
Peach,	<i>Egeria itiosa</i> , (borer,) - - -	In the wood, - - -	Wire.
"	<i>Aphis persicæ</i> , (plant lice,) -	Leaves, - - -	Showering soap.
"	<i>Psylla pyri</i> , (thrips,) - - -	" " " - - -	" "
Plum,	<i>Notodonta coccinea</i> , (red hump caterpillar,) -	Under leaves, and on forks of branches, - - -	Brush and soap.
"	<i>Selandria cerasi</i> (slug,) -	Same as in cherry. - - -	
"	Plum weevil is supposed to make nests by puncture. -		
"	<i>Rynchænus nenuphar</i> , (curculio,) -	In the plum and on some leaves, - - -	Various methods.

This table contains all the most injurious insects, and many others comparatively harmless. I will not recapitulate the means for their removal or prevention, but will especially call your attention to the fact that it is the fruit trees, *almost alone*, that need to be protected, and that the much abused elm is more free than any other tree except the maple and ash.

The evil has been that persons have reasoned too hastily, even with regard to the fruit trees themselves; probably Forsyth himself never made any accurate experiments for the purpose of ascertaining the absolute benefit to trees of his preparation, which was the progenitor of all that have been offered since his time.

As I have said, improvers do not merely scrape, they prune and manure at the same time, and by cultivation give the tree all it needs. Most triumphantly some defender of the other side will tear up the loose bark of the nearest tree, and show the cocoons and eggs beneath, and exultingly ask, now what have you to say? Simply that the eggs will be found to be those of the spider or some other creature, harmless, at *least*,

to the tree that protects them. Having thus shown that no insects, and no lichens, &c., injurious to the tree are to be removed by the present process, whilst the tree is necessarily injured by the removal of nature's warm covering, we may proceed to our third division, beauty.

We are forced to confess that we are of those who believe *nature's taste best*; who do not believe that to strip the moss from the rose bud, or the gray and golden lichens from the tree's bark, is anything but *the most direct violation* of good taste? A continued study of the constituents of taste, or appreciation of the beautiful, has taught mankind that each perfect individual has a special beauty arising from its unity, and speciality of constitution; men have learned, as the fruit of years' study, *that to entirely fulfil the conditions of being is a very chief beauty*, and that every effort to warp one individual into the sphere of another results in a loss of some of the elements of perfection in the individual so transferred.

The tree scrapers, some of them, assume that smooth barked trees are more nearly perfect in their appearance and uses, than the rough; and that however much better the rough bark may serve the functions of the tree, the superior beauty of smoothness and uniformity will compensate for the deterioration of the active powers of vegetation.

But, as when the artist desires to produce a perfect statue, or painting, he *studies the best models*, so the tree growers should *seek out and admire nature's best efforts*. The best elms grow in Connecticut river valley; the best maples in Vermont; the best oaks in the western oak openings; and the best ash in many of our New England States. How did these trees acquire their magnificence and beauty? There they stand in the meadows, with the grass close up to their stems, tall, stalwart, graceful, and magnificent; their sides are decked with lichens, and ploughed with furrows; no more splendid specimens can be found in the world, and yet all they have had is fresh air, water, and a soil abounding in the necessary constituents for their growth. Here, then, is our standard; we do not wish to surpass—we shall be more than satisfied to equal them. No scraper ever profaned their sides, and no whitewash brush ever shamed their beauties.

Another argument, in addition to beauty, for the process is, that the rough and outside bark interferes with the necessary evaporation from the trunk. So far from hindering evaporation there is none to hinder; in the young twig, seedling, or scion, there is an evaporation through the epidermis, as may be seen by cutting off a scion, and sealing its end, when in time it will shrivel; but as time passes, this epidermis is pushed out of the way by the new undergrowth, and loses all vitality, serving after that, so far as we know, only to protect the more tender parts from the bitter winds and burning sun. Probably these very unpopular furrows, as they extend down to the cambium, are the vehicle of any possible evaporation by the sides and bottoms. *If age has incapacitated the rough bark trees, if they are unable to live unassisted*, how much more

blessed are the smooth-barked, the maple, linden, &c. See the fallacy and inconsistency of such reasoning. The maple, &c., having smooth bark, perform their functions healthfully in their age. All trees ought, therefore, to have smooth bark to perform their functions properly in old age. The elm, &c., have not smooth bark, and are consequently diseased, and must be cured with a three-cornered scraper and a strong arm. But, if trees were intended to have a rough bark, and it is removed, injury ought logically to follow, and it does; the tender bark below, through which the sap passes from the branches to the roots, is exposed; undue evaporation takes place, and ends in oxydation; this excessive evaporation is very injurious and weakening, and were the amount lost in that way to run from any one wound, the lesson would convince all. Many have dogmatized upon the necessity of cutting off branches smoothly, in order to allow the bark readily to heal over, and yet the very same men will gash and tear the bark of the same tree, to an unlimited extent, the ill effects of which may be seen by the newly wounded surface becoming brown, as does a green apple when cut and exposed to the air. Such an exposure to wind and sun of the under bark as has been made on the Boston Common elms is ruinous, and if persevered in must destroy the trees.

How great the amount of evaporation would be made from the bark of tree, no experiments have been made to prove; but as we know liquids will evaporate when in connection with the air, and any substance filled with water becomes dry in the sunlight, reason assures us that there cannot fail to be a very large amount from so large a surface as the trunk of one of our stately forest trees, unless defended by the rough bark. And since no evaporation should take place, by fair rights, every ounce that passes off, after scraping, is a drain upon the energies of the tree.

It has been, therefore, so clearly shown that there are no economical or scientific reasons for the present practice, and no need of any scraping, but at the worst mere rubbing and washing with soap, and as we cannot suppose any man, whose opinion is desirable, is likely to think *the beauty of the tree increased by this practice*, we will spare you any elaborate discussion of the reasons why the beautiful tracery and combination of the lines, and the rare and harmonious combinations of colors as exhibited in the lichens, surpass any other similar beauty in the vegetable kingdom, and we do, therefore, offer the following series of resolves to this Society as the result of our investigation, and do urge this Society that they be published in such manner as is most likely to spread them widely before the horticultural world:—

That, whereas it is a common custom to scrape off the outside bark of fruit and ornamental trees, and wash and plaster them with lime and other preparations, in the hope of benefiting the trees by the destruction of parasites and insects injurious to vegetation, and of improving their general appearance, the Massachusetts Horticultural Society do hereby resolve,

for reasons which have been stated, they consider this practice of no benefit to the tree *from its inability* to affect the majority of the *insects which are really injurious* ; and unnecessary in the case of lichens and mosses, they being not *the cause but the consequence of disease and decay* ; and a positive violation of the laws of vegetable physiology, and consequently an injury to all trees, but ornamental in particular, to an *incalculable amount*.

Resolve 2d, That as lichens and mosses, in a healthy state of the tree, are, so far as can be ascertained, no injury to the bark, but, from their varied colors and forms, one of its chiefest ornaments, any operations for their removal are to be scrupulously avoided, and reprehended.

Resolve 3d, That as strict inquiry has shown that bark lice, woolly aphis, and some borers do lay their eggs and hatch their young upon the bark of apples, pears, peaches, and maples, *near the ground, and in the forks of the branches*, a gentle rubbing with some pliable but stiff wire or other brush, on the parts affected, to be followed by a washing with weak, soft or whale oil soap suds, is desirable and will be of benefit, when a careful examination shall have shown that the eggs are deposited upon any tree in question, *but that this process is unnecessary, and uneconomical when the presence of the enemy has not been most clearly proved*.

Resolve 4th, That nature is the best and only true guide in horticultural operations ; and that if we wish to equal her in the health and beauty of our plantations, we must as nearly as may be follow in her footsteps ; that as she provided some trees with rough, and some with smooth bark, there can be no doubt that the cortical differences have an intimate connection with, and relation to, the vitality and economies of the tree, and we view any separation of it from the tree, or any operations on its surface having for their aim to reduce the rough bark to the smooth, or vice versa, *decidedly unscientific, and unworthy improved horticulture*.

Resolve 5th, That as it has been shown that fruit trees are specially liable to be injured by a few insects, whose eggs may be removed by proper rubbing, it by *no means follows that all trees are to be subjected to the same treatment* ; that we would most strenuously discountenance any such *universal medicinal practice* ; that it must not be forgotten in reasoning with regard to horticultural operations, that fruit trees are *sui generis*, and being necessarily diseased need much more care and attention than ornamental ; and as we grow the one for fruit alone, and the most of it we can get, and the other for beauty and shade, so each needs a separate culture ; and as one of the most delightful charms of the ornamental tree is this very roughness of bark, with its accompanying lichens, we consider *that man's taste unworthy and uncultivated who can lay a rough hand upon the tree to reduce all to one unvarying uniformity*.

Resolve 6th, That as all bark is, from its composition, open to the attacks of alkaline preparations, and as no good and sufficient reasons can be adduced for their use, and as their caustic and cement-like nature tends to destroy the tissues, and prevent a proper expansion of the bark and stem,

and as they are necessarily accompanied with considerable outlay, *we most sincerely hope the practice will cease.*

Resolve 7th. Although the subject of pruning has but little connection with bark culture, still, as they go hand in hand, they may not unreasonably be discussed at the same time; and whilst, for the *reasons above stated, fruit trees need peculiar cultivation, and a certain amount of pruning, ornamental require only to be well planted and manured, and should never be touched by a pruner's hand farther than to remove dead wood,* and we do regard with great sorrow and regret, all those efforts made by the ignorant *to trim away the beauty of the lower and hanging branches, reducing the tree, in too many cases, to a close resemblance of a bunch of brush elevated on the top of a pole.*

For the Committee,

R. MORRIS COPELAND.

Roxbury, March 6, 1854.

By the publication of the accompanying Report, neither the Massachusetts Horticultural Society nor the Committee would wish to consider the practice of washing and scraping *Fruit trees* totally to be condemned, but hope that it will draw from the friends of horticulture any information that will throw new light upon the subject.

Any such information may be addressed to the undersigned, or to Dr. EBEN WIGHT, Corresponding Secretary of the Horticultural Society.

For the Committee,

R. MORRIS COPELAND.



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